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Cyclic voltammetry of natural flavonoids on mwnt-modified electrode and their determination in pharmaceuticals

Ziyatdinova G., Aytuganova I., Nizamova A., Morozov M., Budnikov H.
Kazan Federal University, 420008, Kremlevskaya 18, Kazan, Russia

Abstract

The determination of rutin, quercetin and taxifolin in pharmaceutical dosage forms using cyclic voltammetry on multi-walled carbon nanotube modified glassy carbon electrode (MWNT-GCE) has been developed. The surface of the electrode created has been characterized by atomic force microscopy. Electrode modification with MWNT increases the surface average roughness (190-fold) and structures it. There are two oxidation steps at 0.22 and 0.80, 0.23 and 0.80, 0.26 and 0.86 V on cyclic voltammograms of taxifolin, quercetin and rutin, respectively, in phosphate buffer solution of pH 7.4. The linear dynamic range is 1.4-28 and 28-210, 2.0-220 and 0.52-210 μM with detection limits of 0.71, 1.0 and 0.26 μM for rutin, quercetin and taxifolin, respectively. The relative standard deviation of flavonoids determination in pharmaceuticals does not exceed of 7%. The data obtained are in good agreement with coulometric determination.

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Keywords

Carbon nanotubes, Chemically modified electrodes, Cyclic voltammetry, Flavonoids, Pharmaceutical analysis